

Claims

10/501221  
DT04 Rec'd PCT/PTO 12 JUL 2004

1. Method for determining the position of a mobile object (MT) using at least one radio signal with a rotating transmission characteristic (1, 7, 9) of at least one reference station (BS), characterized in that
  - the mobile object (MT) when detecting the radio signal checks for the presence of a reference event ( $t_0, t_4, \dots, SFN_0, SFN_4, \dots$ ), with the relationship between the orientation of the transmission characteristic (1, 7, 9) and reference events ( $t_0, t_4, \dots, SFN_0, SFN_4, \dots$ ) being known to the mobile object (MT) and defined data structures or data content ( $SFN_0, SFN_4, \dots$ ) of the radio signal being communicated as reference events, and
  - the mobile object (MT) determines the orientation of the transmission characteristic (1, 7, 9) from the reference event ( $t_0, t_4, \dots, SFN_0, SFN_4, \dots$ ), and determines a position relative to the reference station (BS) from the orientation of the transmission characteristic (1, 7, 9).
- 20 2. Method in accordance with Claim 1, characterized in that the mobile object (MT) additionally determines its relative distance (d) to the reference station (BS) from the signal parameters (P) of the radio signal.
- 25 3. Method in accordance with the preceding Claim, characterized in that physical transmission parameters of the radio signal measured by the mobile object are regarded as signal parameters (P).

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4. Method in accordance with Claim 2,  
characterized in that

data content of the radio signal containing information on physical  
transmission parameters of the radio signal is regarded the signal  
5 parameter.

5. Method in accordance with one of the preceding Claims,  
characterized in that

- the mobile object (MT) when detecting a second radio signal checks  
10 for the presence of a reference event (t0, t4, ..., SFN0, SFN4, ...),  
determines the orientation of the transmission characteristic (1, 7, 9)  
of the second radio signal from the reference event (t0, t4, ..., SFN0,  
SFN4, ...), and from the orientation of the transmission characteristic  
(1, 7, 9) of the second radio signal determines its position relative  
15 to a second reference station (BS2), and  
- the mobile object (MT) determines its position relative to the  
reference stations (BS1, BS2) from the position relative to the first  
and second reference station (BS1, BS2).

20 6. Method in accordance with one of the preceding Claims,  
characterized in that

time-related reference events (t0, t4, ...) are communicated as  
reference events.

25 7. Method in accordance with Claim 1,  
characterized in that

identification data (SFN0, SFN4, ...) that identifies the specific data  
segments of the radio signal are communicated as reference events.

30 8. Method in accordance with one of the preceding claims,  
characterized in that

numbers of data frames are communicated as identification data (SFN0, SFN4, ...).

9. Method in accordance with a preceding Claim,  
5 characterized in that  
the transmission characteristic is generated by at least one rotating  
directional radiation (1, 7) of the radio signal.

10. Method in accordance with the preceding Claim,  
10 characterized in that  
the transmission characteristic of the radio signal is generated by  
several rotating directional radiations (1, 7).

11. Method in accordance with one of Claims 1 to 8,  
15 characterized in that  
the transmission characteristic is generated by an omnidirectional  
radiation characteristic (8) of the radio signal in which at least one  
rotating directional attenuation (9) of the radio signal is generated.

20 12. Method in accordance with one of Claims 1 to 11,  
characterized in that  
signaling data and/or communication data of a radio communication  
system is transmitted by the radio signal.

25 13. User terminal (MT) of a radio communication system, having a  
device (RCDU) for detection of a radio signal with a rotating  
transmission characteristic (1, 7, 9), a device (RCU) for checking the  
presence of a reference event (t0, t4, ..., SFN0, SFN4, ...) defined as  
the data structure or data content (SFN0, SFN4, ...) of the radio  
30 signal, a device (ODU) for determining the orientation of a

transmission characteristic (1, 7, 9) of the radio signal from the reference event ( $t_0, t_4, \dots, SFN_0, SFN_4, \dots$ ), a device (BDU) for determining a position relative to a reference station (BS) from the orientation of the transmission characteristic 1, 7, 9).

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14. User terminal (MT) in accordance with Claim 13,  
characterized by  
a device (RDU) for determining the relative distance (d) to the  
reference station (BS) from signal parameters of the radio signal.

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